

REMARKS

Applicant has carefully reviewed and considered the Non-Final Office Action mailed January 11, 2005, and the references cited therewith. Claims 13-18, 38-41, 49-52, 58-61, 70-80, 85, 86, 96, 97, 100-102, 115, 116 are amended, claims 6, 8, 10-12, 23-36, 88-90 are cancelled, and new claims 117-124 are added. No new matter is added. Claims 1-5, 7, 9, 13-22, 37-87, 91-124 are pending, and consideration of these claims is requested. Please charge any required fees to deposit account 502931.

Allowable Subject Matter

Claims 7, 13-15, 38-41, 46-52, 55-61, 71-80, 85, 86, 88-90, 96, 97, and 103-105 were deemed allowable over the prior art of record. The examiner objected to these same claims as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim, and any intervening claims.

Claim 71 is amended to be independent and to include all limitations of base claim 1. Claims 13-15, 72-79, 85, and 86 are each amended to be dependent on amended allowable claim 71, and each further limits the range of electrolyte-film thickness. Allowable claims 103-105 are dependent upon amended allowable claims 13-15.

Claim 38 is amended to be independent and to include all limitations of base claim 1. Claims 39-41, 49-52, and 58-61 are amended to be dependent on amended allowable claim 38, and further limit the range of ion energy.

Claim 46 is amended to be independent and to include all limitations of base claim 1. Claims 47, 48, 55-57 are amended to be dependent on amended allowable claim 46, and further limit the range of ion energy.

Claim 96 is amended to be dependent on amended allowable claim 14, Claim 97 is amended to be dependent on amended allowable claim 39, and each further limits the deposition method.

Claims 88, 89, and 90 are cancelled, since they were identical to claim 14.

Applicant has added new claims 117-124 to more fully describe the claimed invention. New claims 117-119 are dependent on claims 38, 46, and 71, respectively, which were indicated

as allowable. The new claims are supported by original claims 16 and 96. No new matter is added. Reconsideration is respectfully requested.

Claim Objections

Claims 114, 115, and 116 were objected to since they were duplicates to each other. Claims 115 and 116 are amended to be different than 114, and include the thickness ranges of allowable claims 15 and 73.

Claims 6, 8, 10, 11, 12, 46, 62, 66, 67, and 70 were objected to since they appeared to be duplicate claims. Claims 6, 8, 10, 11, and 12 are cancelled since they are duplicates of claims 46, 62, 66, 67, and 70, respectively. Claims 100, 101, and 102 are amended to depend on claims 66, 67, and 70 instead of cancelled claims 10, 11, and 12, respectively. Claims 46, 62, 66, 67, and 70 are now unique and not duplicate. Reconsideration is respectfully requested.

Claim Rejections – USC § 103

Claims 1-6, 8-12, 16-22, 37, 42-45, 53, 54, 62-70, 81-84, 87, 91-95, 98-102, 106-113 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson (6,402,796) in combination with Allen et al. (6,077,621) and Chen et al. (6,645,656). Applicant respectfully traverses.

Benefit under 35 U.S.C. § 119 for priority in 35 U.S.C. § 103 was not given in the Office Action since the Examiner could “not find in the provisional applications where the aspect of the electrolyte is deposited by the dual laydown method as set forth in applicant’s instant claims and therefore, the use of the Chen et al and Johnson patents listed in the 103 rejection are deemed to be proper.” Applicant respectfully traverses. Provisional Application Serial No. 60/191,774, filed March 24, 2000, titled “Comprehensive Patent for the Fabrication of a High Volume, Low Cost Energy Products Such as Solid State Lithium Ion Rechargeable Battery, Supercapacitors and Fuel Cells” disclosed on pages 11 through 18 the aspect of the electrolyte being deposited by the dual laydown method as set forth in applicant’s instant claims. In particular, the Applicant points out Figs. 1 on pages 12, 14, and 16, along with the description under “1. Abstract:” on pages 11, 13, and 14. Page 18 of this provisional ties together the above descriptions to disclose the aspect of the electrolyte is deposited by the dual laydown method as set forth in Applicant’s

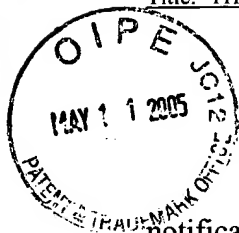
instant claims. Reconsideration is respectfully requested.

The filing date for Provisional Application Serial No. 60/191,774 is March 24, 2000, which is the same filing date as Chen et al. (6,645,656). The filing date for Provisional Application Serial No. 60/191,774 predates Johnson (6,402,796) and Allen et al. (6,077,621). Any purported combination of Chen with Allen or Johnson cannot occur until the filing date of the latter-filed application(s). Since the 35 U.S.C. § 119 claimed priority date of the present application antedates the cited references, the date of invention of the present claimed subject matter as a whole (as evident in the provisional application, as just described) antedates the filing dates of the cited references, and would not have been obvious to a person having ordinary skill in the art at the time the present invention was made. Reconsideration is respectfully requested.

Further, Applicant respectfully disagrees with the characterizations given by the Examiner to Allen et al. As clearly stated in the Allen ABSTRACT, "The process includes the cleaning of a membrane surface with a low energy electron beam followed by the deposition of the metal or metal-oxide film by a high energy electron beam of ions." At column 5 lines 35-39 Allen states "The energy of the high and low power ion beam is dictated by both the gas employed, and ultimately (for the high power) by the power available to the instrument. Typical low power beams range from 100-500 eV while high power beams range from 500-2000 eV." This is also described at column 4 lines 16-23 and lines 39-47. Thus, Allen does not use ions or beams with less than 500 eV to deposit any films or layers, but rather the low-power beams are only used to clean the substrate before the metal or metal oxide film is deposited using the high-power beam (in the range of 500-2000 eV). Still further, the films deposited by Allen are deposited onto an electrolyte (column 1 lines 10-12) and form metal-membrane electrodes (column 4 line 26-27). Allen states "The second, higher energy beam, e.g. O_2^+ or N_2^+ , and the electron-evaporated species (e.g. platinum, iridium, gold, rhenium, rhodium, tantalum, tungsten, silver, zinc, iron, copper, nickel, etc.) are aimed at the surface. It is believed that the concurrent ion stitching densifies the now forming film and improves the adherence between the film and the substrate." Thus, Allen fails to describe deposition of an electrolyte, so the energy ranges do not apply to the present claims. Accordingly, the present claims appear to be allowable over the cited references, and reconsideration and allowance of the claims is respectfully requested.

Applicant also respectfully disagrees with the characterizations given by the Examiner to Johnson. As clearly stated in the Johnson at column 4 lines 59-62, "The deposited cathode current collector is approximately 250 Angstroms thick and is formed with a space 19 directly below the insulator 15, as shown in FIG. 1." This 250-Angstroms-thick cathode current collector is on the opposite side of the cathode with respect to Johnson's electrolyte, and is thus inapplicable to the Examiner's argument relative to the claims of the present application, which are directed to the electrolyte and its thickness. See also Allen column 5 lines 7-10, "As such, the 5-10 micron thick, original layer of substrate 11 is replaced with an extremely thin, 250 Angstrom thick, layer of a cathode current collector 18. This replacement of the thick substrate layer greatly increases the volumetric portion of active material as compared to the overall volume of the battery cell." It is inappropriate to use a reference discussing 250-Angstroms-thick cathode current collector made of metal (an electron conductor) such as nickel, gold, or silver (column 4 line 57) to try to show obviousness of the ultra-thin electrolyte (an ion conductor but a non-conductor of electrons) of the present invention. Accordingly, the present claims appear to be allowable over the cited references, and reconsideration and allowance of the claims is respectfully requested.

The Examiner also attempts to use Chen to assert obviousness, asserting that Chen et al and Allen et al both show dual-beam and single beam ion assisted deposition can be used to deposit electrodes but electrolytes as well can be made in such a manner. However, Applicant respectfully submits that Chen cannot be used for such purposes, since Chen has a March 24, 2000 filing date, which is the same filing date as Applicant's Provisional Application Serial No. 60/191,774, filed March 24, 2000. Applicant's Provisional fully describes using ion-assisted deposition of the thin-film layers for lithium-ion batteries (see citations above that show where in the provisional is the description). Accordingly, the present claims appear to be allowable over the cited references, and reconsideration and allowance of the claims is respectfully requested.



CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (952-278-3501) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 502931.

Respectfully submitted,

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Date

11 May 2005

By

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Date of Deposit: May 11, 2005

This correspondence is being deposited on the date indicated above with the United States Postal Service pursuant to 37 CFR 1.10, and is addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450